Ideal helix geometry

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April 17, 2012

1 Overview

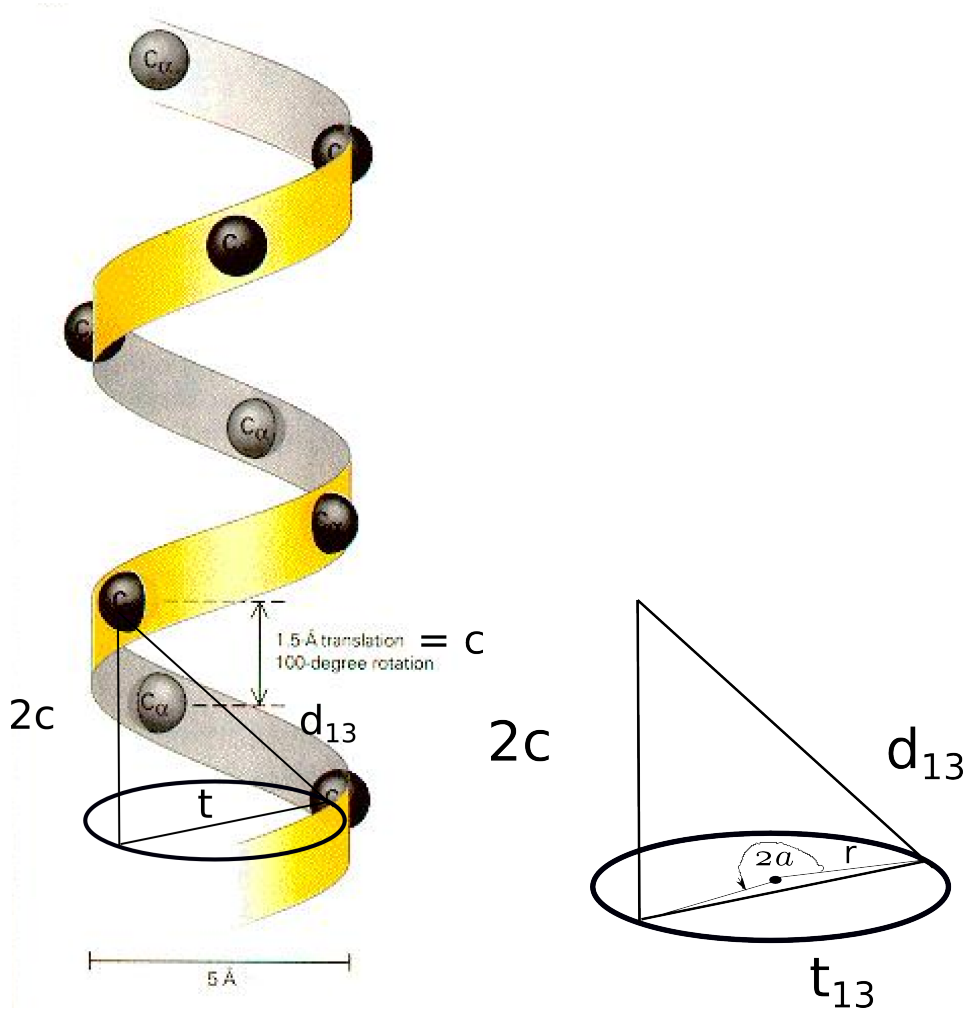

Figure 1: Distance between $c_\alpha 1$ and $c_\alpha 3$.

c is climb (=1.5Å). The angle $\alpha = 100\,\text{deg}$. The radius of the helix, r, is 2.3Å. Solving for t_{13} (Fig. 1). t_{13} is the chord over the angle $2\pi - 2\alpha$:

$$t_{13} = 2r \sin\left(\frac{2\pi - 2\alpha}{2}\right) \tag{1}$$

Then the distance between $c_\alpha 1$ and $c_\alpha 3$:

$$d_{13} = (2c)^2 + t_{13}^2 = 5.43\mathring{A}. \tag{2}$$

Similarly

$$t_{14} = 2r \sin\left(\frac{2\pi - 3\alpha}{2}\right) \tag{3}$$

$$d_{14} = (3c)^2 + t_{13}^2 = 5.05\mathring{A}. \tag{4}$$